Interband pairing in cuprate superconductivity

N. Kristoffel\textsuperscript{a}, P. Rubin\textsuperscript{a} and T. Õrd\textsuperscript{b}

\textsuperscript{a}Institute of Physics, University of Tartu, Riia 142, 51014 Tartu, Estonia
\textsuperscript{b}Institute of Physics, University of Tartu, Tähe 4, 51010 Tartu, Estonia

The nonrigid electron spectrum of a cuprate superconductor is modelled by an itinerant band and nodal and antinodal defect subbands created by doping. In the case of hole doping the region near the top of the oxygen band is involved, for electron doping near the bottom of the UHB. It is supposed that the leading pair transfer channel works between itinerant and defect states. Bare gaps between these subsystems are expected to be quenched by doping and are sources of pseudogaps. Band overlap conditions determine the phase diagram special points. Illustrative mean-field calculations have been made with a plausible parameter set. Self-consistent results\textsuperscript{*} demonstrate that the elaborated approach is able to reproduce the behaviour of cuprate basic superconducting characteristics as e.g. the doping dependence of $T_c$, superconducting gaps and pseudogaps, supercarrier density and effective mass, coherence lengths and the penetration depth, critical magnetic fields and some other properties. Interband pairing scheme is suggested to be an essential aspect of cuprate multiband superconductivity.


Subject category:
1. Strongly Correlated Electrons and High Temperature Superconductivity

Presentation mode:
poster

Corresponding author:
N. Kristoffel

Address for correspondence:
Institute of Physics, University of Tartu, Riia 142, 51014 Tartu, Estonia

Email address:
kolja@fi.tartu.ee